




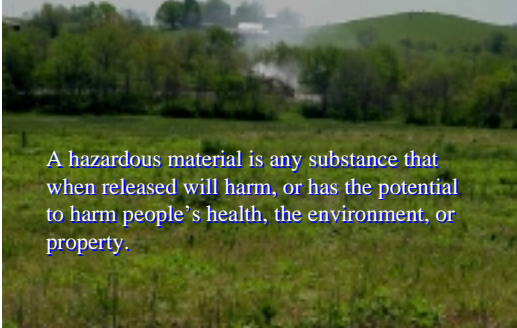





Slides	Primary Course Information	Instructor Activity/Information
  <p>The Kentucky Emergency Response Commission</p> <p>Presents</p>		<p>The Kentucky Emergency Response Commission (KyERC), or SERC (State Emergency Response Commission) has approved and sponsors this training.</p> <p>The KyERC is tasked by law to approve any training intended for hazardous materials responders.</p>
		<p>The Kentucky Division of Emergency Management (KyEM) developed this course for KyERC. In addition, KyEM provides administrative support to the commission.</p>
<p><u>A few words about this class...</u></p> <ul style="list-style-type: none"> • This is a complete rewrite of the hazardous materials training curriculum. • Courses were re-written according to Ky law and regulations. • Testable - need 70% to pass • Any feedback is appreciated on student evaluation forms. 	<p>This course was designed specifically for <u>Kentucky</u> emergency responders.</p> <p>95% of the incidents and pictures in this course took place in Kentucky and are less than 3 years old.</p> <p>Meets 29 CFR 1910.120 - OSHA Law Meets most of NFPA 472</p>	<p>This course is a complete overhaul of the curricula. It reflects Kentucky laws and standard practices.</p> <p>The course is testable and requires a 70% to pass.</p> <p>Students will be given an opportunity to provide feedback to strengthen the course at the end of this course. All comments are read when the tests are graded.</p>

Slides	Primary Course Information	Instructor Activity/Information
<p>Welcome</p> <ul style="list-style-type: none"> • Course Roster • Successful Completion = 70% • Course Certificates • Employer Letters • Wallet Cards • Course Schedule • Safety 	 <p>Student Participation</p> <p>Students should introduce themselves by providing:</p> <p style="padding-left: 40px;">Name and Title</p> <p style="padding-left: 40px;">Agency or Department</p> <p style="padding-left: 40px;">Reason for attending the class</p> <p style="padding-left: 40px;">Expectations for this class</p>	<p><i>This is a check list for before the course starts.</i></p> <p>Rosters - MUST BE LEGIBLE</p> <p>Courses Hours - 12 hours for this course</p> <p>Certificates/Employer Letters - Usually given out in a month from the last day of the course</p> <p>Breaks - 10 minutes after every 50 minutes of instruction. Longer breaks means the class gets out later.</p> <p>Safety - Practice what you preach in the classroom.</p> <p>Pagers and Cell Phones - Recommend turning them off, unless the students are on call.</p> <p>You should introduce yourself and any other instructors after the students introduce themselves.</p>
<p>Introduction</p> <ul style="list-style-type: none"> • Member of a team that responds to a hazardous material release. • Must have successfully completed hazardous materials first responder awareness level course that meets OSHA 1910.120 • Course follows the D.E.C.I.D.E. model. 		<p>D - Detect the presence of HazMat</p> <p>E - Estimate the likely harm without intervention</p> <p>C - Choose response objectives</p> <p>I - Identify action options</p> <p>D - Do the best option</p> <p>E - Evaluate progress</p> <p>D.E.C.I.D.E. was developed in 1975 by Ludwig Benner from the National Transportations Safety Board (NTSB) after responders were being hurt when responding to traffic accidents involving hazardous materials. This provides the flow of the course because fo the logical approach to a hazmat incident. See the student manual for more information.</p>
<p>Expectations</p> <ul style="list-style-type: none"> • Must participate in classroom activities. • Must score at least a 70% • Must practice safety 	<p>In addition, to classroom participation scoring 70% on the test safety, a student <u>may miss up to 2 hours</u> of this course before he or she will be required to retake the course.</p>	

Slides	Primary Course Information	Instructor Activity/Information
<p>Responsibilities</p> <p>This course is designed for individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, the environment, and property from the effects of the release.</p>	 <p>This is one of the objectives and may be seen in some form</p>	<p>This is the definition of the operations level as stated in 29CFR 1910.120 (q)</p> <ol style="list-style-type: none"> 1) Persons who respond to releases or <u>potential releases</u>. 2) To protect nearby persons, then environment, and property.
<p>Hazardous Material</p>  <p>A hazardous material is any substance that when released will harm, or has the potential to harm people's health, the environment, or property.</p>	 <p>This is one of the objectives and may be seen in some form</p>	<p>This is the definition of hazardous materials for emergency responders.</p> <p>OSHA EPA DOT</p> <p>— All have specific definitions</p>
	 <p>How do you approach a scene like this when you are responding to a possible hazmat emergency?</p>	<p>This is the CSX railyard in Greenup (Greenup Co). Notice the numerous tank cars.</p>

Slides

Primary Course Information

Instructor Activity/Information



What about a scene like this?
What are the hazards?
What type of hazardous materials, if any should you be aware of?

What are the dangers to responders?

This is the Apollo Oil facility located near Winchester (Clark County). Flammable and combustible liquids are stored here. Use this as an opportunity to review, briefly, the AWARENESS skills of the students.



What about a scene like this?
What are the hazards?
What type of hazardous materials, if any should you be aware of?

What are the dangers to responders?

This is large facility that produces fuming sulfuric acid, or oleum. It is located near the Greenup (Greenup Co) Railyard. Oleum is not only a corrosive, but it also presents an inhalation hazard. In addition, this facility borders the Ohio River. Use this as an opportunity to review, briefly, the AWARENESS skills of the students.

How do you approach scenes like this????

- Consider all hazards
- Establish the Incident Management System
- Assign a Safety Officer - It's the Law
- Establish Control Zones
- Identify the Hazardous Material
- Perform Risk Analysis
- Notify Appropriate Authorities
- PPE and Decontamination

Review these items with the students. This is basic scene assessment.

- 1) Discuss the definition of hazards.
- 2) IMS will be discussed in greater detail later.
- 3) 29CFR 1910.120 requires the use of a safety officer for HAZMAT emergencies. It is good sense to use one on all scenes though.
- 4) Identify hazardous materials.
- 5) Performing risk analysis - See page 112 in the student manual.
- 6) Notification
- 7) PPE and DECON - Will discuss later

Slides



Primary Course Information

Student Participation



Ask students to name the types of hazardous materials cargo containers:

- 1) Flammable/Combustible Liquid
- 2) Compressed gases
- 3) Corrosive liquids
- 4) Cryogenic
- 5) Dry bulk containers

Instructor Activity/Information

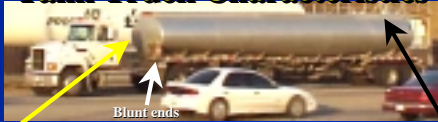


Restate these in your own words:

Terminal Objective - Be able to recognize and identify the most common container systems used in road and rail transportation.

Enabling Objectives - On page 8 of the student manual. Be familiar with them, but don't read them verbatim. Students are asked on whether or not the objectives were stated.

Tank Truck Characteristics



Slightly Oval Shape Low Pressure Tank Trucks Dome/Crash Covers



Cigar Shape High Pressure Tank Trucks

ANIMATED SLIDE



Crash covers - house the vapor recovery system and protect manways
Access ladders - Usually hollow and provide channels for liquids to flow from the top to the ground.

Blunt ends - Characteristic of low or atmospheric pressure tanks. Not exclusive though.

Oval Shape - The wider the tank, usually the lighter the material and lower the operating pressure.

DOT 406/MC 306 Non Pressure Liquid Tank

9,000 GALLONS CAPACITY
GENERAL PURPOSE CARGO

OPS Pressure Less Than 3 PSI
Typical Maximum Capacity 9,000 Gallons

New Tanks Aluminum

Older Tanks Steel

Oval Shape/Multiple Compartments

Recessed Manways/Rollover Protection

Bottom Valves

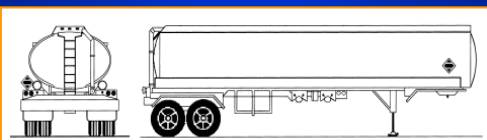
Will Likely have Vapor Recovery.

Gasoline
Fuel Oil
Alcohol
Other Flammable/Combustible Liquids
Liquids
Liquid Fuel Products
(In Non-Coded Tankers)



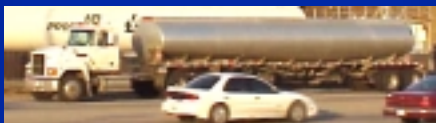
Possible contents/size/operating pressure of the tank

Same illustration is on page 9 in the Student manual.



Slides

Design Features Of Flammable Liquid Tankers



Construction is usually aluminum, but some are light weight stainless steel.

- CANNOT contain pressurized gases;
- most likely to contain flammable or combustible liquids;
- may contain non-flammable liquids like milk or molasses
- not likely to contain corrosives;
- B.L.E.V.E. potential is minimal.

Design Features Of Flammable Liquid Tankers



Off-loading is performed through bottom valves.

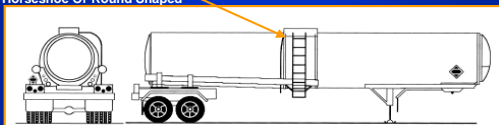
DOT 407/MC 307 Low Pressure Chemical Tank

6,000-7,000 GALLONS CAPACITY
TRANSPORTS CHEMICALS, FLAMMABLE AND COMBUSTIBLE LIQUIDS

OPS @ 25-40 PSI

Typical Maximum Capacity 6,000 Gallons
May Be Rubber Lined/Steel
Single or Double Top Manhole
Single Outlet Discharge for Each
Compartment At Bottom (Midship Or Rear)
Typically Double Shell
Stiffening Rings
Rollover Protection
May Be Multiple Compartments
Horseshoe Or Round Shaped

Flammable Liquids
Combustible Liquids
Acids
Caustics
Poisons



Primary Course Information

What is B.L.E.V.E.?

*Boiling
Liquid
Expanding
Vapor
Explosion*

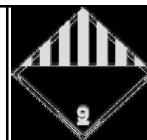


Two emergency shut-offs - On the trailer near the drivers door (may be near the passenger door depending on the make of the trailer) and the other is on the left side, just above the fender.



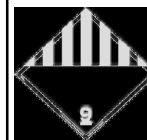
Possible contents/size/operating pressure of the tank

Instructor Activity/Information



These are likely to be aluminum construction. Under fire conditions, aluminum will usually melt staying nearly even with the liquid level. This is why the BLEVE potential is minimal.

Also because of the aluminum construction, the containers will usually not carry strong corrosives.

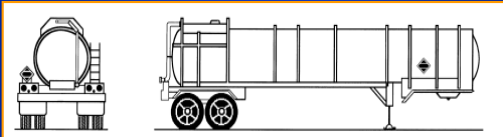







In many cases, tankers carrying gasoline and diesel are allowed to stay wet. This means that product is allowed to stay in the off-loading pipes.

In the event of an accident, there is a possibility of up to 55 gallons of product to be released.

These fittings also have shear points that will allow them to be torn away without damaging the tank. In addition, there are two valves, one inside the tank and one near the attachment.

Same illustration in on page 11 in the student manual

Slides	Primary Course Information	Instructor Activity/Information
<p>MC-312 Corrosive Liquid Tank</p> <p>OPS Pressure Less Than 75 PSI Typical Maximum Capacity 6,000 Gallons May Be Rubber Lined/Steel Stiffening Rings And Rollover Protection Splash Guard Provides Rollover Protection Top Loading At Rear Or Center Loading Area Typically Coated With Corrosive Resistant Material Small Diameter For Length (Tube Shaped) Typical Single Compartment</p> <p>Corrosive Liquids Typically Acids</p> 	 <p>Possible contents/size/operating pressure of the tank</p>	<p>Same illustration in on page 12 in the student manual</p>
<p>Design Features Of Corrosive Tankers</p> <p>Common features:</p> <ul style="list-style-type: none"> • have relatively blunt ends, with some roundness; • much smaller in diameter than a pressure vessel; • can be very long; • have several, up to 10, reinforcing rings encircling the exterior of the tank that add strength to the tank; • construction materials vary; • frangible disc on top, not self-closing. 	<p>This is a DOT-412. Notice the different silhouette shape. There is an outer jacket on this tank.</p>	 <p>These tanks are not supposed to have sumps or washouts in the bottom of the tank. Loading usually takes place in the crash box on top.</p> <p>Alert your students to the possibility of some product being in the crash box.</p>
 <p>Protective housing with fill box</p> <p>Stiffening Rings for support</p> <p>Spec Plate</p> <p>Secondary Hazard Placard</p> <p>Primary Hazard Placard</p>	<p>Animated slide</p>	 <p>The truck in the slide is also DOT-412. This type of 412 has an exemption because of the material of construction. The tank is made of FRP - Fiberglass Reinforced Plastic. There is no interior coating or liner. This particular truck is used to carry oleum which is extremely heavy,</p>

Slides

Primary Course Information

Instructor Activity/Information

Design Features Of Corrosive Tankers



Loading & off-loading is performed through rear valves.

Design Features Of Corrosive Tankers

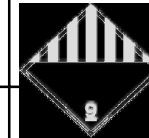
Emergency responders should familiarize themselves with these tankers & their unique features, general appearance & likely contents:

- WILL have corrosives;
- somewhat likely to contain a flammable liquid, like grain alcohol;
- likely to contain poison liquid or oxidizing liquid;
- will NOT contain pressurized gas;
- B.L.E.V.E. potential is moderate to high.

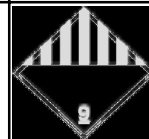


Frangible (Rupture) Disk

These tanks are meant to carry heavy products hence the small diameter and the reinforcement rings. Therefore, the tanks will hold much greater pressures and that means that there is a greater chance for B.L.E.V.E.



In addition, these trucks usually have liners of rubber or ceramics or something that is corrosion resistant. This can cause difficulty if the vehicle is involved in a flame impingement situation, especially in the case of a rubber lining. The lining will melt and allow the actual metal tank to be exposed to the product. This can lead to the failure of a tank and a catastrophic release of the product - at least in theory.



This is a picture of the frangible or rupture disk. This specific picture is on a railcar, but from this angle it looks the nearly the same.

The disks are designed to intentionally fail at specific pressures to release building pressures in a container. Usually, you will find the fail pressure around the rim of the disk.

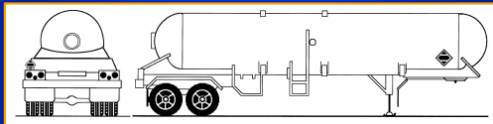
Slides

MC-331 High Pressure Tank

11,500 GALLONS CAPACITY
TRANSPORTS LP GAS AND ANHYDROUS AMMONIA

OPS Pressure UP To 300 PSI
Typical Maximum Capacity 11,500 Gallons
Single Steel Compartment/Non Insulated
Bolted Manhole At Front or Rear
Internal and Rear Outlet Valves
Typically Painted White Or Other Reflective Color
May Be Marked Flammable Gas and Compressed Gas
Round/Dome Shaped Ends

Pressurized Gases & Liquids
Anhydrous Ammonia
Propane
Butane
Other Gases Liquefied Under Pressure

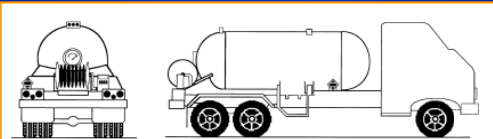


MC-331 High Pressure Tank Bobtail

3,500 GALLONS CAPACITY
TRANSPORTS LP GAS AND ANHYDROUS AMMONIA

OPS Pressure UP To 300 PSI
Typical Maximum Capacity 3,500 Gallons
Single Steel Compartment/Non Insulated
Bolted Manhole At Front or Rear
Internal and Rear Outlet Valves
Typically Painted White Or Other Reflective Color
May Be Marked Flammable Gas and Compressed Gas
Round/Dome Shaped Ends

Pressurized Gases & Liquids
Anhydrous Ammonia
Propane
Butane
Other Gases Liquefied Under Pressure



Design Features Of Compressed Gas Tankers

Common features:

- diameter is perfectly round;
- evenly rounded ends;
- construction is high grade steel that varies from 1/2 inch to 1 inch;



- at least one & sometimes two PRV's (pressure relief valves);
- PRV's are spring loaded, self-closing & recessed into the top of the tank for rollover protection.

Primary Course Information



Possible contents/size/operating pressure of the tank

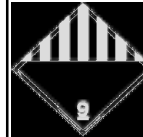
The illustration of the bobtail is not in the student manual



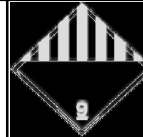
Two emergency shut-offs - On the trailer near the drivers door (may be near the passenger door depending on the make of the trailer) and the other is located near the control box. The control box may be located in the rear or on the side.

Instructor Activity/Information

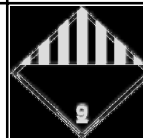
Same illustration in on page 13 in the student manual



Compressed gas tankers may be classified as MC-330's or MC-331's. The difference is not significant unless the truck is not upright. MC-330's were not manufactured after 1993. MC-330's are recognizable by the location of the bolted manway. If the manway is in the liquid space (center of the tank end), it is an MC-330. If it is in the vapor space (top of the tank end), it is an MC-331. The significance of this is that if the tanker is not upright then the gaskets are directly exposed to product (if LP - temp is -44 F) and may fail.



Although these may look different from the MC-331, it is the same with the exception of quantity.



In addition, on home delivery trucks, the operator is required to have a remote control that will stop the pump. Some remotes will stop the engine of the truck, while others will roll the delivery hose on a reel.

Slides

Primary Course Information

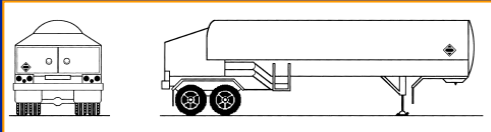
Instructor Activity/Information

MC-338 Cryogenic Liquid Tank Truck

WELL-INSULATED 'THERMOS BOTTLE' DESIGN
TRANSPORTS LIQUID NITROGEN, OXYGEN CARBON DIOXIDE, ETC.

OPS AT Less THAN 22 PSI
Well Insulated Thermos Bottle Like Steel Tank
May Have Vapor Discharging from Relief Valves
Loading/Unloading Valves Enclosed at Rear
May Be Marked "Refrigerated Liquid"
Round Tank with Same Type of Cabinet at Rear

Liquid Oxygen
Liquid Nitrogen
Liquid Carbon Dioxide
Liquid Hydrogen
Other Gases That Have Been
Liquefied by Lowering Their
Temperature



Possible contents/size/operating pressure of the tank

Same illustration in on page 14 in the student manual

Design Features Of Cryogenic Tankers

Common features:

- diameter is round;
- relatively blunt ends;
- construction varies;
- larger in diameter than pressurized gas or flammable liquid tanker;
- has a large box or compartment mounted at the rear of the tank;
- design features give the tank an appearance of immense size, but the inner tank rarely exceeds 7,000 gallons.



Two emergency shut-offs - On the trailer near the drivers door (may be near the passenger door depending on the make of the trailer) and the other is located near the control box. The control box may be located in the rear or on the side.



Have students identify the class by using the placard
Have them look up the placard - UN 1073

Design Features Of Cryogenic Tankers

Common features (continued):

- a frangible disc is located at the top of the tank, which acts as the PRV, & is NOT self-closing;
- these vehicles are also equipped with a true pressure relieving device for emergency venting in case of fire;
- these vehicles are equipped with a breather venting device, similar to a PRV.

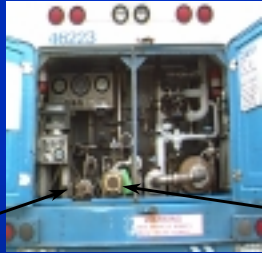


Slides

Primary Course Information

Instructor Activity/Information

Design Features Of Cryogenic Tankers



Loading & off-loading is performed through rear valves.

Besides the obvious hazard of the product, alert the students to the cryo (cold) aspect. This slide shows the frost on the piping.

Design Features Of Cryogenic Tankers

Emergency responders should familiarize themselves with these tankers & their unique features, general appearance & likely contents:

- WILL have cryogenic liquids;
- likely to contain corrosives;
- likely to contain flammable gas;
- likely to contain a poison or oxidizing liquid;
- will NOT have pressurized gas;
- B.L.E.V.E. potential is very high.

Design Features Of Cryogenic Tankers



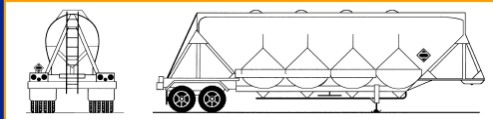
Emergency shut-offs are usually spring-loaded and located in the rear compartment and occasionally near the cab.

Slides

Dry Bulk Cargo Tanker

OPS AT Less THAN 22 PSI
Typically Not Under Pressure
Over the Road
Top Side Manholes
Bottom Valves/Air Assisted Loading/Unloading
Shapes Vary, But Will Have Hoppers

Calcium Carbide
Oxidizers
Corrosive Solids
Cement
Plastic Pellets
Fertilizers



Primary Course Information

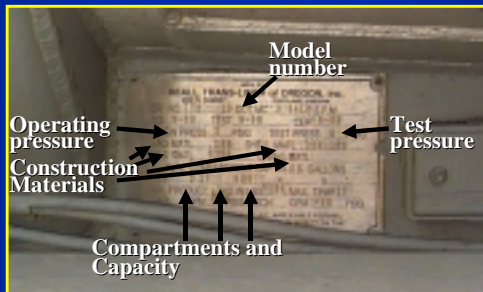
Possible contents/operating pressure of the tank

Instructor Activity/Information

Same illustration in on page 15 in the student manual



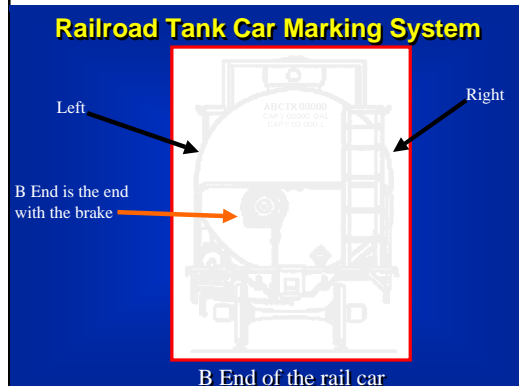
Tank Truck Characteristics Spec Plate



Slides

Primary Course Information

Instructor Activity/Information



ANIMATED SLIDE

This is a cask. Use the opportunity here to show the primary hazard placard, the secondary hazard placard, and the orange panel.

Student can expect to see this diagram again.



This is a cask. This is used to transport radioactive materials. This is a very solid, but durable container. It is sealed and very secure. The testing of these usually involves a jet locomotive and a 10-15 ft concrete wall.

This diagram is in the student manual on page 17.

The "B-end" of a railcar is the universal point of reference. It is important to rail and rescue personnel.

Slides

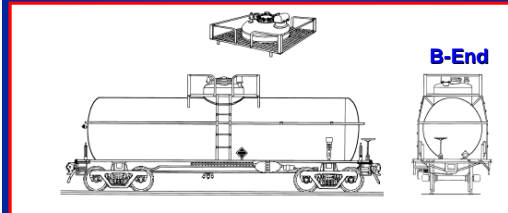
DOT 103 - General Service

10,000 GALLON CAPACITY - INSULATED
FOR GENERAL SERVICE COMMODITIES

Non-Insulated or Insulated.
General Service.

Safety valves (35" psi) or Safety Vent (60 psi).

Phosphorus, Benzene,
Gasoline, Vegetable Oil,
Caustic Soda, Fuel Oil,
Alcohol



Primary Course Information



Possible contents of the tank/general
type of tank

Instructor Activity/Information

This diagram is on page 17 of the student
manual

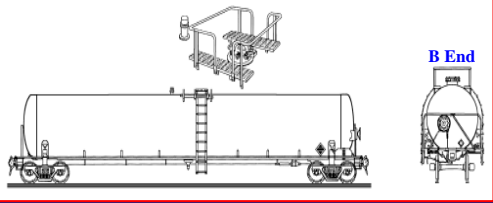

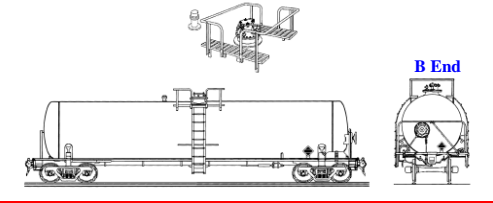

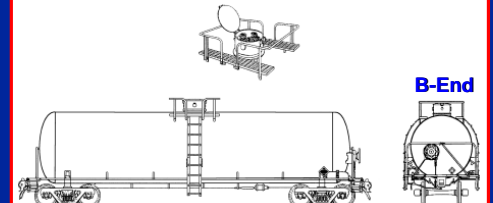

On these types of tank cars, you might find
different types of hardware, including rupture
disks, usually under a mushroom shaped
cover, thermometer well, a vacuum breaker,
used to keep the car from imploding.



If there is hardware outside the protective
housing (manway cover) then it is probably a
low pressure tank.
This is the general rule of thumb, although it
is not universal.



Be certain to talk about some of the fittings that
will and won't be found on a non/low pressure
tank car.

Slides	Primary Course Information	Instructor Activity/Information
<p>DOT 111 General Service Car</p> <p>26,000 GALLON CAPACITY - NONINSULATED DOT 111A100W1 FOR GENERAL SERVICE COMMODITIES Non-Insulated or Insulated. Safety Valve (75 psi) or Safety Vent (100 psi).</p> <p>Kerosene, Gasoline, Fuel Oil, Vegetable Oils, Phosphorus</p> 	 <p>Possible contents of the tank/ operating pressure of tank</p>	<p>This is on page 18 of the student manual</p>
<p>DOT 111A100W1 Sulfuric Acid Car</p> <p>13,600 GALLON CAPACITY - NONINSULATED DOT 111A100W2 FOR SULFURIC ACID SERVICE POST 1982</p> <p>Safety Valve (75 psi) or Safety Vent (100 psi). Non-Insulated or Insulated. Safety Valve (75 psi) (Required on Certain Commodities) or Safety Vent (100 psi).</p> <p>Vegetable Oils, Phosphorus, Aqueous Hydrofluoric Acid (60% to 80%), Mixed Acid, Sulfuric Acid</p> 	 <p>Possible contents of the tank/ operating pressure of tank</p>	<p>This is not in the student manual</p>
<p>DOT 105 - Chlorine Service</p> <p>90 TON CAPACITY - INSULATED DOT 105A500W FOR CHLORINE SERVICE (POST 1982)</p> <p>Insulated, Safety Valve (375 psi) Chlorine Carbon Dioxide (350 psi) Anhydrous Hydrofluoric Acid Liquefied Petroleum Gas Liquefied Hydrocarbon Gas Fertilizer Ammoniating Solution (Ammonium Nitrate Solution)</p> 	 <p>Possible contents of the tank/ operating pressure of tank</p>	<p>This is on page 19 of the student manual</p>

Slides

Primary Course Information

Instructor Activity/Information

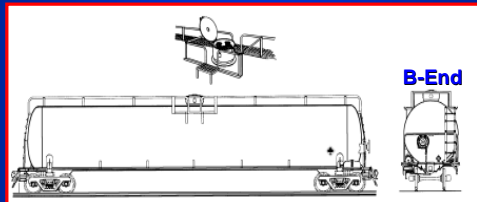


DOT 112 - LP Gas Service

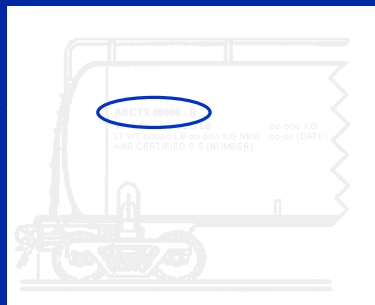
33,500 GALLON CAPACITY - NONINSULATED
DOT 112J400W
FOR PROPYLENE, LIQUEFIED PETROLEUM GAS
AND ANHYDROUS AMMONIA SERVICE

Liquefied Petroleum
Gas
(V.P.) Not Exceeding
300 psi @ 115° F)
Vinyl Chloride

Same as DOT 112T400W Except Equipped with Head Protection and a Thermal Protection System. Enclosed in a Metal Jacket. No Reflective Paint Required.



Railroad Tank Car Marking System



Left side of the rail car



Possible contents of the tank/
operating pressure of the tank

Be certain to talk about some of the fittings that will and won't be found on a pressurized tank car.

This is on page 20 of the student manual

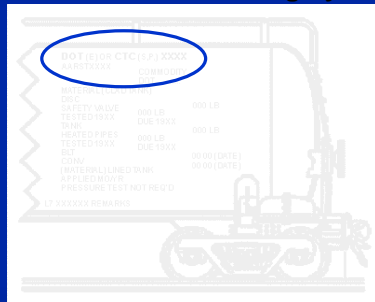


Students will be required to identify a tank car by its identification markings.

This is on page 22 of the student manual

Slides

Railroad Tank Car Marking System



Right side of the rail car

Primary Course Information



Students will be required to use the railcar tank marking system to identify the car.

Instructor Activity/Information

This is on page 22 of the student manual

Railroad Tank Car Marking System

AUTHORIZING AGENCY	CLASS DESIGNATION	SEPARATOR CHARACTER	TANK TEST PRESSURE (PSI)	TYPE OF MATERIAL USED IN TANK CONSTRUCTION	TYPE OF WELD USED	OTHER CAR FEATURES
<p>Tank car specifications start with three letters designating the agency under whose authority the specification was issued</p> <ul style="list-style-type: none"> •DOT - Department of Transportation •AAR - Association of American Railroads •ICC - Interstate Commerce Commission (Regulatory Authority Assumed by DOT in 1966) •CTC - Canadian Transport Commission 	<p>The Three Digit Class Designation Follows the Authorizing Agency and Some 111 Tank Cars</p> <ul style="list-style-type: none"> •Non-Pressure Tank Cars •Pressure Tank Cars •Cryogenic Liquid Tank Cars •Miscellaneous Tank Cars 	<p>Significant only for Class 105, 113, 114 Tank Cars Cars When Retrofitted.</p> <ul style="list-style-type: none"> "X" - Top and Bottom Shell Couplers "S" - Tank Headshields, Top and Bottom Shell Couplers "J" - Jacketed Thermal Protection, Tank Headshields, Top and Bottom Shell Couplers "T" - Spray-On Thermal Protection, Tank Headshields, Top and Bottom Shell Couplers 	<p>105, 102, & 111</p> <p>"A" - Aluminum (Classes 103, 105, 102, & 111)</p> <p>"N" - Nickel</p> <p>"C", "D" or "E" - Stainless Steel (Alloy/Steel)</p>	<p>"No Letter" - Carbon Steel</p> <p>"AL" - Aluminum (Classes 103, 105, 102, & 111)</p> <p>"A" - Aluminum Alloy</p> <p>"N" - Nickel</p> <p>"C", "D" or "E" - Stainless Steel (Alloy/Steel)</p>	<p>"W" - Fusion Welding</p> <p>"F" - Forge Welding</p>	<p>Fittings, Materials, Linings</p>



Students will be required to use the railcar tank marking system to identify the car.

This is on page 23 of the student manual

Railroad Tank Car Marking System

AUTHORIZING AGENCY	CLASS DESIGNATION	SEPARATOR CHARACTER	TANK TEST PRESSURE (PSI)	TYPE OF MATERIAL USED IN TANK CONSTRUCTION	TYPE OF WELD USED	OTHER CAR FEATURES
<p>Tank car specifications start with three letters designating the agency under whose authority the specification was issued</p> <ul style="list-style-type: none"> •DOT - Department of Transportation •AAR - Association of American Railroads •ICC - Interstate Commerce Commission (Regulatory Authority Assumed by DOT in 1966) •CTC - Canadian Transport Commission 	<p>The Three Digit Class Designation Follows the Authorizing Agency and Some 111 Tank Cars</p> <ul style="list-style-type: none"> •Non-Pressure Tank Cars •Pressure Tank Cars •Cryogenic Liquid Tank Cars •Miscellaneous Tank Cars 	<p>Significant only for Class 105, 113, 114 Tank Cars Cars When Retrofitted.</p> <ul style="list-style-type: none"> "X" - Top and Bottom Shell Couplers "S" - Tank Headshields, Top and Bottom Shell Couplers "J" - Jacketed Thermal Protection, Tank Headshields, Top and Bottom Shell Couplers "T" - Spray-On Thermal Protection, Tank Headshields, Top and Bottom Shell Couplers 	<p>105, 102, & 111</p> <p>"A" - Aluminum (Classes 103, 105, 102, & 111)</p> <p>"N" - Nickel</p> <p>"C", "D" or "E" - Stainless Steel (Alloy/Steel)</p>	<p>"No Letter" - Carbon Steel</p> <p>"AL" - Aluminum (Classes 103, 105, 102, & 111)</p> <p>"A" - Aluminum Alloy</p> <p>"N" - Nickel</p> <p>"C", "D" or "E" - Stainless Steel (Alloy/Steel)</p>	<p>"W" - Fusion Welding</p> <p>"F" - Forge Welding</p>	<p>Fittings, Materials, Linings</p>

Slides

Primary Course Information

Instructor Activity/Information

Railroad Tank Car Marking System

111 CLASS DESIGNATION

The Three Digit Class Designation Follows the Authorizing Agency

Authorizing Agency	Class Designation	Material Used	Type of Weld	Other Car Features
•Non-Pressure Tank Cars	DOT-103 AAR-201A DOT-104 AAR-203W DOT-111 AAR-206 DOT-115 AAR-211A	Steel	Fusion	Fittings, Materials, Linings
•Cryogenic Liquid Tank Cars	DOT-113 AAR-204W AAR-204X (Inside Box Car)	Aluminum	Forge	Welding
•Miscellaneous Tank Cars	DOT-106A DOT-110A Multi-Unit Tank Car Tanks DOT-107A High-Pressure Tank Car AAR-207 Pneumatically Unloaded Covered Hopper AAR-208 Wooden Tank Car	Steel	Forge	Welding
•Pressure Tank Cars	DOT-105 DOT-114 DOT-109 DOT-120A	Steel	Forge	Welding

Railroad Tank Car Marking System

A SEPARATOR CHARACTER

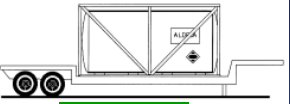
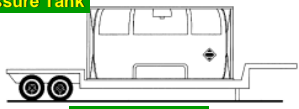


Significant only for Class 105, 113, 114 Tank Cars and Some 111 Tank Cars When Retrofitted.

Authorizing Agency	Separator Character	Material Used	Type of Weld	Other Car Features
•DOT - Department of Transportation	"A" - Top and Bottom Shelf Couplers	Steel	Fusion	Fittings, Materials, Linings
•AAR - Association of American Railroads	"S" - Tank Headshields, Top and Bottom Shelf Couplers	Aluminum	Forge	Welding
•ICC - Interstate Commerce Commission (Regulatory Authority Assumed by DOT in 1966)	"J" - Jacketed Thermal Protection, Tank Headshields, Top and Bottom Shelf Couplers	Steel	Forge	Welding
•CTC - Canadian Transport Commission	"T" - Spray-On Thermal Protection, Tank Headshields, Top and Bottom Shelf Couplers	Steel	Forge	Welding

Railroad Tank Car Marking System

60 TANK TEST PRESSURE (PSI)

Authorizing Agency	Tank Test Pressure (PSI)	Material Used	Type of Weld	Other Car Features
•DOT - Department of Transportation	60	Steel	Fusion	Fittings, Materials, Linings
•AAR - Association of American Railroads	60	Aluminum	Forge	Welding
•ICC - Interstate Commerce Commission (Regulatory Authority Assumed by DOT in 1966)	60	Steel	Forge	Welding
•CTC - Canadian Transport Commission	60	Steel	Forge	Welding

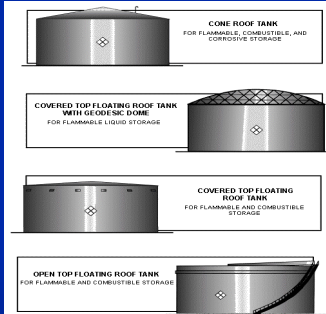
Slides	Primary Course Information	Instructor Activity/Information
<p data-bbox="262 159 537 186">Intermodal Containers</p>  <p data-bbox="210 298 331 318">Pressure Tank</p>  <p data-bbox="317 415 453 435">Cryogenic Tank</p>  <p data-bbox="457 513 579 532">Tube Modules</p>	<p data-bbox="688 159 1310 305">Intermodal containers are used in Kentucky on rail, road, and river. They are simply smaller tanks that are enclosed within a protective cage.</p>	
<p data-bbox="174 638 627 703">Chapter 2 - Fixed Facility Bulk and Non-Bulk Container Systems</p> 		
<p data-bbox="310 1125 480 1153">A Few Facts</p> <ul data-bbox="184 1214 600 1393" style="list-style-type: none"> • Over 5,000 facilities with HazMat • Nearly 1,500 with EHS • Containers will vary on the product, the amount, and the use of the material. • Non-Bulk containers use in transportation and fixed facilities. 		

Slides

Primary Course Information

Instructor Activity/Information

Fixed Facility Tanks Atmospheric Pressure Tanks



These are dome roof tanks at the Old Grandad Facility between Frankfort and Georgetown. These are full of whiskey.

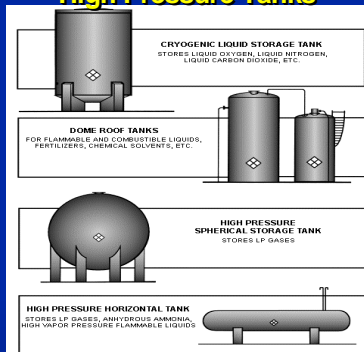


These are dome roof tanks at the Apollo Oil Facility between Winchester and Mt. Sterling on I-64. These are full of gasoline, fuel oils, and lube oils.

Slides



Fixed Facility Tanks High Pressure Tanks



Primary Course Information

Instructor Activity/Information

This is large facility storage tank holds nearly 1 million gallons of fuming sulfuric acid, or oleum. It is located near the Greenup (Greenup Co) Railyard. Oleum is not only a corrosive, but it also presents an inhalation hazard. In addition, this facility borders the Ohio River.

Although these look like dome roof tanks, they are actually cryogenic tanks. Another example of these are the O₂ tanks at hospitals. A spherical tank is in the background.

Slides

Primary Course Information

Instructor Activity/Information



A spherical tank in Greenup.



This is probably the most common tank in the state for pressurized gases.

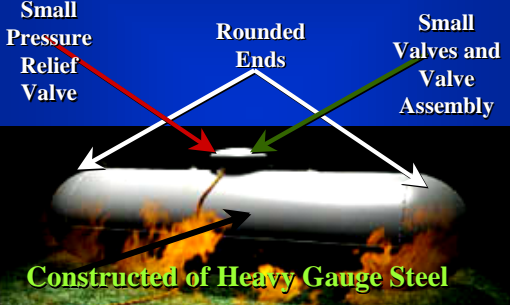



**National Fire Protection Association
NFPA 704 Marking System**

- Used on fixed facilities only (Non-mandatory)
- Colors represent specific hazard
 - Blue = health
 - Red = flammable
 - Yellow = reactivity
 - White = special information
- Numbers
 - Range from 0 – 4
 - Higher numbers = greater the hazard

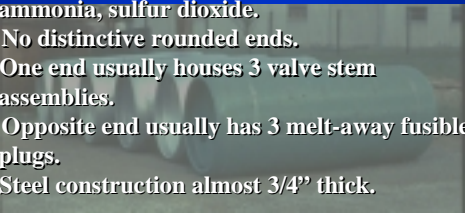


The information on this slide is on the test.
The meaning of the colors
The indication of the numbers
The probable location of this placard.



- 0 - No or minimal hazard
- 1 - Slight hazard
- 2 - Moderate hazard
- 3 - Serious hazard
- 4 - Severe hazard

Slides	Primary Course Information	Instructor Activity/Information
<p>Key characteristics of containers for Pressurized Gases</p> 	 Students will need to identify a pressurized tank from a similar description.	
<p>Types of Containers for Pressurized Gases</p> <p>Less than 1/2 gallon</p>  <ul style="list-style-type: none"> a. Commonly used for small cutting torches b. Constructed in steel c. Equipped with melt away fusible plug d. Usually disposable, not meant for refilling <p>Methyl Bromide comes in 1/4 gallon aerosol cans</p>		<p>A quarter gallon of Methyl Bromide is highly lethal in a small to medium sized room.</p>
<p>Types of Containers for Pressurized Gases</p>  <p>1 to 20 gallon containers</p> <ul style="list-style-type: none"> a. Constructed in steel. b. Commonly used for camper stoves, RV fuel, and bar-b-ques. c. Has unmistakable rounded top. d. Valve assembly is on top e. May be equipped with melt away fusible plug or small pop-up relief valve f. Designed for refilling 		

Slides	Primary Course Information	Instructor Activity/Information
<p>Types of Containers for Pressurized Gases</p> <p>20 to 50 gallon containers</p> <ol style="list-style-type: none"> Tall upright cylinders Usually referred to by weight (100-150Lb Cylinders) Can range from 8"-12" diameter 2 to 5 feet tall Valve stem is at the top with screw on valve cap Used for about every type of compressed gas 		
<p>Types of Containers for Pressurized Gases</p> <p>20 to 50 gallon containers</p> <p>Could have any of the following gases and more</p> <ul style="list-style-type: none"> • Acetylene • Oxygen • Propane • Hydrogen • Ethylene oxide • Helium • Nitrous Oxide • Sulfur Dioxide 		
<p>Types of Containers for Pressurized Gases</p> <ol style="list-style-type: none"> There is no color coding system. For positive identification of the contents, you must check the label on the tank or the shipping papers. Valve Stem Assemblies for each gas is unique. All valve stems have melt away fusible plugs that act as relief valves. (except some poisonous gas cylinders - (Chlorine, Bromine, Cyanide) 		<p>This is fairly important for the students to grasp. There is not a set method of identifying the contents of a cylinder. Labeling is the best method, but not absolute.</p>

Slides	Primary Course Information	Instructor Activity/Information
<p>Types of Containers for Pressurized Gases</p> <p>50 to 200 gallon containers</p> <ul style="list-style-type: none"> a. Commonly used for LPG powered vehicles. b. Rounded ends, mounted in the trunk or pickup bed. c. Mounted horizontally with gauge and stems on top. d. Large upright tanks are called "PIGS." f. Usually have recessed concave tops where valves are located. g. Range between 2-3 feet in diameter. h. Gases common - LPG, ethylene oxide, nitrogen, helium. 		
<p>Types of Containers for Pressurized Gases</p> <p>One Ton Container (approx. 300 gallons)</p> <ul style="list-style-type: none"> a. Commonly used for chlorine, anhydrous ammonia, sulfur dioxide. b. No distinctive rounded ends. c. One end usually houses 3 valve stem assemblies. d. Opposite end usually has 3 melt-away fusible plugs. e. Steel construction almost 3/4" thick. 		
<p>Types of Containers for Flammable Liquids</p> <p>What to look for:</p> <ul style="list-style-type: none"> a. Blunt flat ends b. Normally no pressure relief valves c. Removable caps for pour spouts, off loading d. Construction usually is light gauge steel e. Might be marked with placards or labels 		

Slides	Primary Course Information	Instructor Activity/Information
<p>Types of Containers for Flammable Liquids</p> <p>Up to 1/2 gallon containers</p> <ul style="list-style-type: none"> a. Metal/rectangular in shape <ul style="list-style-type: none"> •paint thinners •solvents •oils b. Plastic - round with handle <ul style="list-style-type: none"> •paint thinners •solvents •paint removers 		
<p>Types of Containers for Flammable Liquids</p> <p>1 to 5 gallon containers</p> <ul style="list-style-type: none"> a. Metal and plastic containers <ul style="list-style-type: none"> •Round or rectangular b. 6" to 18" high <ul style="list-style-type: none"> •All kinds of flammable and combustible materials 		
<p>Types of Containers for Flammable Liquids</p> <p>5 to 55 gallon containers</p> <ul style="list-style-type: none"> a. Mostly metal - should always be stored upright. b. Plastic drums are increasing. c. Round or rectangular. d. This has been referred to as the workhorse container. <ul style="list-style-type: none"> •All kinds of flammable and combustible materials 		

Slides	Primary Course Information	Instructor Activity/Information
<p>Types of Containers for Corrosive and Poisonous Liquids</p> <p>Corrosive and Poisonous liquids and some Oxidizers often use the same type of steel and plastic containers which are used for flammable liquids</p> <p>Labeling is the key to identification of the materials within They are easy to confuse with flammable liquids.</p>	<p>A picture of a carboy is on page 31 of the student manual.</p> <div data-bbox="659 280 800 415">  </div> <p>The labeling system HMIS is on page 28 of the student manual. Be certain to introduce the students to that.</p>	
	<p>Pipeline Marker</p>	